



U.S. System Summary: FRONT RANGE



Front Range High-Speed Rail System (Source: RMRA)

The Front Range high-speed rail system described in this summary is a system of proposed routes containing 356 miles in three segments wholly contained within the State of Colorado with a hub in Denver and spokes connecting to Fort Collins, Pueblo, and Eagle County. All three segments of the Front Range high-speed rail system are currently in the *Planning/Environmental* phase, with both incremental improvements to existing freight railroad

rights-of-way and infrastructure and construction of new railroad corridors being considered. Feasibility studies for high-speed rail in the Front Range system have examined various alternative technologies for service with maximum speeds up to 300 mph. None of the segments of the Front Range high-speed rail system are part of a federally-designated high-speed rail corridor.

SYSTEM DESCRIPTION AND HISTORY

System Description

The Front Range high-speed rail system consists of three segments, as summarized below.

Front Range High-Speed Rail System Segment Characteristics

Segment Description	Distance	Segment Status	Designated Corridor?	Segment Population
Denver, CO, to Fort Collins, CO	81 Miles	Planning/Environmental	No	2,843,112
Denver, CO, to Pueblo, CO	120 Miles	Planning/Environmental	No	3,348,158
Denver, CO, to Eagle County, CO	155 Miles	Planning/Environmental	No	2,630,983

The Denver to Fort Collins segment is 81 miles in length and encompasses the fast-growing suburban areas north of Denver along the route. The total population of communities being considered for proposed high-speed rail stations along this segment was 2,843,112 in 2010. The Denver to Pueblo segment is 120 miles in length and includes Colorado Springs along the route. The total population of communities being considered for proposed high-speed rail stations along this segment was 3,348,158 in 2010. Collectively, these two segments (approximately parallel to I-25) cover an area with a population of 3,647,788, or approximately 72.5 percent of Colorado's population in 2010.

The western Denver to Eagle County segment is 155 miles long and includes many of Colorado's most popular tourist and recreational destinations along the route. The total population of communities being considered for proposed high-speed rail stations along this segment was 2,630,983 in 2010. High-speed rail service on all three segments of the Front Range high-speed rail system is being considered in the form of incremental upgrades to existing freight railroad corridors as well as the construction of new railroad infrastructure and right-of-way.

System History

Planning for high-speed rail in the Front Range high-speed rail system dates back to the early 2000s. In 2001, the Colorado Department of Transportation submitted a letter to the U.S. DOT expressing interest in designation of the Colorado Corridor as the 11th Federally-designated high-speed rail corridor. However, the U.S. DOT was not accepting new applications for Federally-designated corridors at that time and no further action was taken.

In 2006, the Colorado Department of Transportation formed the Rocky Mountain Rail Authority (RMRA), a multi-jurisdictional government body comprised of more than 50 local public agencies. The RMRA led an 18-month feasibility study to evaluate high-speed intercity passenger transportation options in the I-70 corridor between Den-

ver International Airport and Grand Junction, Colorado, as well as the I-25 corridor from Cheyenne, Wyoming, to Trinidad, Colorado, through the major Front Range metropolitan areas of Fort Collins, Denver, Colorado Springs, and Pueblo. The feasibility study, entitled the Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan, was completed in March 2010. The comprehensive feasibility study included detailed engineering assessment of potential routes, an evaluation of the suitability of different types of technology (ranging from 79 mph conventional rail to 300 mph MAGLEV service), and a full ridership and financial analysis of different investment options. The feasibility study identified an "FRA Developed Option" as a recommended route that best fit the Federal Railroad Administration criteria for high-speed rail feasibility. The "FRA Developed Option" route consisted of the three segments, which are considered in this summary as the Front Range high-speed rail system.

Since the completion of the March 2010 feasibility study, two new studies have been initiated to advance rail planning in the Front Range high-speed rail system. The first study, the I-70 Mountain Corridor Advanced Guideway System (AGS) Feasibility Study, is conducting an alternatives assessment of various transit systems (including high-speed rail) for the I-70 mountain corridor (covering the same approximate area as the Denver to Eagle County segment of the Front Range high-speed rail system). The second study, the Colorado Interregional Connectivity Study, is a planning study to develop preferred alternatives for connectivity among light rail, commuter rail, and proposed high-speed rail service in the Denver region. Both studies are coordinated and on-going at the time this summary was completed.

Federally-Designated Corridors

No portion of the three segments of the Front Range high-speed rail system is currently part of a federally-designated high-speed rail corridor. Since 2001, various attempts have been made to secure federally-designated status for the three segments of the Front Range high-speed rail system with additional extensions including routes along I-25 north to Cheyenne, Wyoming, and south beyond Pueblo through New Mexico to El Paso, Texas.

Existing Intercity Passenger Rail Service

Existing intercity passenger rail service covering a portion of the Front Range high-speed rail system includes a segment of the Amtrak California Zephyr long-distance train, which operates between Denver and Grand Junction, Colorado.

Sources: 2010 U.S. Census, Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan, Colorado State Freight and Passenger Rail Plan, Federal Railroad Administration High-Speed Rail Corridors Chronology, Amtrak System Timetable Fall 2011/Winter 2012

ESTIMATED SYSTEM COSTS AND FUNDING SOURCES

Estimated System Costs

The March 2010 Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan provided estimates of the capital costs associated with developing high-speed intercity passenger rail on the three segments of the Front Range high-speed rail system. The feasibility study examined the Denver to Fort Collins and Denver to Pueblo segments as a combined route adjacent to I-25 and the Denver to Eagle County segment as a stand-alone route adjacent to I-70. Capital cost estimates were developed for a variety of scenarios based on right-of-way considerations

and maximum train speed. The estimated capital costs on a per-mile basis are shown below. The estimated capital costs for the I-70 route are much higher than typical costs because of the mountainous grades and tunneling required on that route.

Estimated operating costs per train-mile (2008 dollars) for the Front Range high-speed rail system ranged between \$38.11 and \$52.46, depending upon the maximum speed and technology considered. The various options considered for service (combination of different technology and right-of-way types for the I-25 and I-70 corridors) would generate projected operating ratios between 1.14 and 1.89 and benefit-cost ratios between 1.02 and 1.28 by the year 2035.

Projected Funding Sources

No specific funding sources have been proposed for development of the Front Range high-speed rail system.

Recent Funding Awards

The State of Colorado received two grants from the Federal Railroad Administration for planning projects for the Front Range high-speed rail system. The first grant was \$1,000,000 to fund a portion of the Denver Interregional Connectivity Study, a planning study to coordinate the development of proposed high-speed rail, commuter rail, and light rail routes in the Denver region. The second grant was \$400,000 for the completion of the Colorado State Rail Plan. The funding source for both grants was FY 2009 high-speed rail appropriations.

Sources: Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan, Federal Railroad Administration

Front Range High-Speed Rail System Capital Cost Estimates

Segment Description/Study Name/Year	Maximum Speed/ Scenario	Estimated Capital Cost per Mile (\$ Millions)
Fort Collins, CO, to Pueblo, CO, via Denver, CO (I-25 Route)		
• Rocky Mountain Rail Authority Feasibility Study (2010)	110 mph Existing ROW	\$12.3 – \$12.7
• Rocky Mountain Rail Authority Feasibility Study (2010)	150 mph Existing ROW	\$14.0
• Rocky Mountain Rail Authority Feasibility Study (2010)	220 mph New ROW	\$29.4
Denver, CO, to Eagle County, CO (I-70 Route)		
• Rocky Mountain Rail Authority Feasibility Study (2010)	150 mph Unconstrained	\$99.4
• Rocky Mountain Rail Authority Feasibility Study (2010)	220 mph Constrained	\$87.3
• Rocky Mountain Rail Authority Feasibility Study (2010)	300 mph MAGLEV	\$102.5

TRANSPORTATION SYSTEM IMPACTS

Ridership Estimates

Ridership for the three segments of the Front Range high-speed rail system was estimated in the March 2010 Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan. Technologies considered in this study included diesel, electric, and MAGLEV with maximum speeds between 79 mph and 300 mph. Daily frequencies ranged from four trains per day for the 79 mph scenario to 24 trains per day for the 300 mph scenario. The estimated system ridership for the three segments for years 2025 and 2045 is shown below.

Ridership estimates for the Front Range high-speed rail system estimated that the proposed high-speed rail network would be able to capture between 1.8 and 17.5 percent of all travel in the three segments by 2035

Mode Choice

Ridership estimates for the Front Range high-speed rail system estimated that the proposed high-speed rail network would be able to capture between 1.8 and 17.5 percent of all travel in the three segments by 2035, as shown above. The projected rail mode share generally increased as the maximum speed of the rail service increased. Ridership projections for the Front Range high-speed rail system also estimated that between 76.4 and 82.3 percent of rail passengers in the year 2035 would shift from other travel modes, including automobile, intercity bus, and airplane.

Front Range High-Speed Rail System Ridership Estimates

Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan (2010)	Estimated 2025 Ridership	Estimated 2035 Ridership	Estimated 2035 Rail Mode Share
79 mph Diesel	2,800,000	3,740,000	1.8%
110 mph Diesel	7,270,000	9,640,000	4.8%
125 mph MAGLEV	20,740,000	28,570,000	13.0%
150 mph Electric	19,130,000	25,420,000	12.0%
220 mph Electric	26,050,000	34,530,000	16.0%
300 mph MAGLEV	28,640,000	37,970,000	17.5%

Connectivity with Other High-Speed Rail Systems

The Front Range high-speed rail system does not connect to any other currently proposed U.S. high-speed rail system.

Sources: Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan

GOVERNANCE

The Rocky Mountain Rail Authority (RMRA) is a multi-jurisdictional government body created by the Colorado Department of Transportation in 2006 to coordinate high-speed intercity passenger rail planning activities in the Front Range high-speed rail system area. The primary function of the RMRA was to serve as the lead agency for a feasibility study examining high-speed passenger rail for the region. This study, the Rocky Mountain Rail Authority High-Speed Rail Feasibility Study Business Plan, was completed in March 2010. Another stated objective of the RMRA was to serve as the lead agency to seek federally-designated status for the I-70 and I-25 corridors, if the feasibility study showed that official corridor designation was feasible. The RMRA is governed by a Board of Directors, which is comprised of representatives from every local government entity that agrees to participate. Ultimately, the RMRA membership included more than 50 Colorado cities, towns, and transit authorities. It is not clear what role the RMRA will have in subsequent high-speed rail development activities in the Front Range high-speed rail system. The recently-formed Colorado Department of Transportation Division of Rail and Transit also oversees rail planning activities across Colorado.

Source: Rocky Mountain Rail Authority Website, Colorado State Freight and Passenger Rail Plan



Denver, Colorado

BIBLIOGRAPHY

Rocky Mountain Rail Authority Website

URL: <http://rockymountainrail.org/index.html>

CDOT I-70 Mountain Corridor Advanced Guideway System (AGS) Feasibility Study Website

URL: <http://www.coloradodot.info/projects/AGSstudy>

Colorado Interregional Connectivity Study Website

URL: <http://www.coloradodot.info/about/committees/trac/Minutes%20and%20Agendas/Wallach%20TRAC%20presentation%2031111.pdf/view>

High-Speed Rail Feasibility Study Business Plan

Prepared for the Rocky Mountain Rail Authority by Transportation Economics & Management Systems, Inc. in association with Quandel Consultants, LLC and GBSM, Inc., March 2010

URL: http://www.rockymountainrail.org/RMRA_Final_Report.html

Date Accessed: June 12, 2012

Colorado State Freight and Passenger Rail Plan

Prepared for the Colorado Department of Transportation by Parsons Brinkerhoff, March 2012

URL: <http://www.coloradodot.info/projects/PassengerFreightRailPlan>

Date Accessed: June 12, 2012